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Velocity of Ultra-Sonic Waves in Vapor

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was made upon the resistance of the cortical layer transverse to the length of the tuber.

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THE EFFECT OF GAS-PRESSURE ON TESLA-LUMINESCENCE

G. M. WISSINK

In investigating the tesla-luminescence of cod-liver oil, it was observed that the nature of the luminescence would change very rapidly with the pressure. This effect was noticed for the cod-liver oil vapor, for carbon-dioxide and for air. In the case of air it was found that there was an abrupt change from a pinkish glow at about 4 mm. pressure to a bright orange at about 2 mm. The actual value of the pressure at which this effect took place has not as yet been accurately determined.

A preliminary spectroscopic study of the luminescence has shown that bands which are prominent at the higher pressure disappear at the lower.

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VELOCITY OF ULTRA-SONIC WAVES IN VAPOR

GEORGE E. THOMPSON

The velocity of sound waves having a frequency of 107,500 cycles per second has been measured in water vapor and in ether vapor. The waves are generated by a quartz crystal oscillator and velocities measured by an interference method similar to that used by Pierce.[1] The sound chamber is made air tight. After thorough exhaustion of the chamber with an air pump the vapor is introduced through a stop cock which connects the chamber with a glass bottle containing vapor. The sliding joint, through which the rod carrying the sound reflector passes, is made air tight by means of a rubber tube, which, by stretching and contracting, allows the reflector to be moved back and forth by a screw mounted outside the chamber.

The best value obtained for the velocity in water vapor is

1 Proc. Am. Acad. 60, 271 (1925).

about 430 meters per second at 26°C. For ether vapor the value is 195 meters per second at 23°C. These values are about five per cent higher than the values given in the International Critical Tables.

By using the velocity formula we get 428 meters per second for

$$V = \sqrt{\frac{\alpha p}{d}}$$

the velocity in water vapor at 25°C (V=1.321), a value which is in satisfactory agreement with the experimental value. For ether vapor at 35°C (V=1.093) the formula gives 199 meters per second which agrees within the limits of experimental error with the experimental result after correction is made for the difference of temperature.

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MEAN FREE PATH OF GASES BY A DIRECT METHOD

John A. Eldridge

Apparatus consists of a brass tube partitioned into chambers. Partitions contain small holes which are exactly aligned. Gas is introduced at a pressure of several millimeters at one end; a vacuum is maintained in other chambers by rapid pumping and the molecular beam passing through the aligned holes is measured by impact upon a vane suspended from a quartz fiber. Introduction of a gas in one of intermediate chambers deflects away a definite proportion of the beam giving a direct measure of the mean free path.

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THE EARTH AS A SOURCE OF HEAT FOR OUT-BUILDINGS

L. V. Crum

The object of this experiment was to investigate the possibilities of ultilizing the earth's heat near the surface to warm chicken houses, garages, and other out-buildings during extremely cold weather.

A section of water radiator was buried in a trench seven feet deep which was dug in the dirt floor of a henhouse. Directly above